EFFICIENT ITERATIVE SOLUTION OF LINEAR SYSTEMS FROM DISCRETIZING SINGULAR INTEGRAL EQUATIONS[*]

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Abstract. In this paper we study the solution of singular integral equations by iterative methods. We show that discretization of singular integral operators obtained by domain splitting yields a system of algebraic equations that has a structure suitable for iterative solution. Numerical examples of Cauchy type singular integral equations are used to illustrate the proposed approach. This paper establishes a theory for experimental results presented previously.

Key words. singular integral equations, non-compact operators, direct solutions, preconditioning, conjugate gradient iterative methods.

AMS subject classifications. 65F10, 65N38, 45E05.

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